Space Weather Forecast

Issued on Tuesday, 13 December 2022 at 13:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate class flares (R1-R2; Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with the largest flare peaking at 12/1509 UTC from the vicinity of one of the smaller groups in the southeast.
This is just one of eleven sunspot regions on the visible disc, with the 24-hour period seeing a rapidly developing bipolar region in the northeast. The largest region is near the southwest limb, with the most magnetically complex also in the southwest. No regions are showing any significant activity or magnetic complexity, however. No Earth-directed Coronal Mass Ejections (CMEs) have been seen in available imagery.

Solar Wind / Geomagnetic Activity: Solar winds were mostly slightly elevated. The wind speed varied between 440-510 km/s, easing after 13/0800 UTC to be between 380-420 km/s. The Interplanetary Magnetic field was weak with the north-south component varying weakly. Geomagnetic activity was Quiet to Unsettled (Kp 0-3).

Energetic Particles / Solar Radiation: No solar radiation storms were observed during the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is most likely to be Low with occasional Common-class flares, but there is also a chance of isolated Moderate-class flares. These are currently most likely from two regions in the southwest, or from the newly developed region in the northeast.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs feature in the current forecast, although with the number of sunspots on the visible disc, some weak CME influence cannot be ruled out. A weak fast wind may arise from a tenuous coronal hole, although with the STEREO-A spacecraft not showing any signs of this, it begins to look as though any fast wind is increasingly unlikely.
All considered, geomagnetic activity is likely to be Quiet to Unsettled, with a slight chance of isolated Active intervals on Days 1 or 2 (13-14 Dec) if we do see any fast wind influence. Predominantly Quiet geomagnetic activity is expected thereafter.

Energetic Particles / Solar Radiation: Solar radiation should remain near background levels throughout, with a daily slight chance of seeing a radiation storm if any significant flares were to occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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